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Original research article

ADENOID HYPERTROPHY IN CHILDREN: CLINICAL PROFILE

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Abstract

Based on the current literature, adenoids can contribute to recurrent sinusitis and chronic persistent or recurrent ear disease because they can harbor a chronic infection. The type and amount of pathogenic bacteria seem to vary based on the disease present and the age of the child. The sample consisted of 100 children who presented with nasal obstruction due to adenoid hypertrophy. The age group of the study sample is between 4-12years. Analysis of adenoid size was made by soft tissue lateral radiograph of nasopharynx.

Majority of childrens had presented with only snoring. 36 of them had presented with mouth breathing and snoring. Only 4 childrens had presented with mouth breathing, snoring and sleep apnoea together.

Keywords: Adenoid Hypertrophy, Children, Clinical Profile

Introduction

Adenoids are present at birth and then begin to enlarge. They, along with the tonsils, continue to grow until individuals are aged 5-7 years. The adenoids usually become symptomatic, with snoring, nasal airway obstruction, and obstructed breathing during sleep, when children are aged approximately 18-24 months. By the time children reach school age, the adenoids normally begin to shrink, and by the time children reach preteen or teenage years, the adenoids are usually small enough for the child to become asymptomatic [1, 2].

At birth, the nasopharynx and, thus the adenoids, are accessible to many organisms. The establishment of the upper respiratory tract is initiated at birth. By the time children are aged 6 months, lactobacilli, anaerobic streptococci, actinomycosis, Fusobacterium species, and Nocardia species are present. Normal flora found in the adenoid consists of alpha-hemolytic streptococci and enterococci, Corynebacterium species, coagulase-negative staphylococci, Neisseria species, Haemophilus species, Micrococcus species. The adenoids can become infected and harbour pathogenic bacteria, which may lead to the development of disease of the ears, nose, and sinuses [3].

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Based on the current literature, adenoids can contribute to recurrent sinusitis and chronic persistent or recurrent ear disease because they can harbor a chronic infection. The type and amount of pathogenic bacteria seem to vary based on the disease present and the age of the child [4].

Overall, the most commonly cultured bacteria have been Haemophilus influenzae, group A beta-hemolytic Streptococcus, Staphylococcus aureus, Moraxella catarrhalis, and Streptococcus pneumoniae, usually in that order. It has been found resistant bacteria of the 3 most common pathogens of otitis media and rhinosinusitis (ie, H influenzae, M catarrhalis, S pneumoniae) in children with those diseases.

Methodology

The sample consisted of 100 children who presented with nasal obstruction due to adenoid hypertrophy. The age group of the study sample is between 4-12years. Analysis of adenoid size was made by soft tissue lateral radiograph of nasopharynx.

Inclusion criteria

All children from 4-12years with bilateral nasal obstruction.

Exclusion criteria

Septal deviation, allergic rhinitis, nasal injury and congenital nasal deformities.

Name, age and sex were noted in all the cases. A detailed clinical history was taken regarding presenting complaints. General, ENT and systemic examination were done in all the cases according to predesigned proforma. Study sample was divided into 3 subgroups 4-6, 7-9 & 10-12 years.

Clinical assessment

Symptoms was evaluated according to the presence of snoring, mouth breathing & sleep apnea in all children. For this purpose mothers were asked about the symptoms.

Radiological assessment

Subjects were evaluated with standard lateral cephalometric radiographs. These radiographs were taken with the childs head immobilized in a wall- mounted cephalostat, with the head in true lateral position. The head was fixed so that the median plane was parallel to the film.

By using the reference points and lines on lateral radiographs of nasopharynx, adenoid size and nasopharyngeal depth was calculated in all x-rays. Three lines drawn from posterior nasal spine; one to posterior superior sphenobasioccipital area, second to nearst adenoidal point and third to basion of occipital bone.

Results

Table 1: Age distribution of study subjects

Age	Frequency (n=100)	Percentage (%)
4-6yrs	27	27
7-9yrs	35	35
10-12yrs	38	38

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The above table shows age distribution of the study population. The age of patients ranged from 4-12 years.

Table 2: Gender wise distribution of the study subjects

Gender	Frequency (n=100)	Percentage (%)
Male	60	60
Female	40	40

60% are male patients and 40% are female patients.
There was male predominance, with male to female ratio being 3:2.

Table 3: Sex incidence among different age groups

		Age group			Total
		4-6yrs	7-9yrs	10-12yrs	
Sex	F Count	12	10	18	40
	% within Sex	30	25	45	100%
	M Count	15	25	20	60
	% within Sex	25	41.7	33.3	100%
Total count		27	35	38	100
% within Sex		27.0%	35.0%	38.0%	100%

Chi Square Test = 2.98, $p<0.225$.

Table 4: Distribution of study subjects based on symptoms

Symptoms	No of Cases	Percentage
Only Mouth Breathing	18	18
Only Snoring	42	42
Mouth Breathing + Snoring	36	36
Mouth Breathing + Snoring + Sleep apnea	4	4

Majority of childrens had presented with only snoring. 36 of them had presented with mouth breathing and snoring. Only 4 childrens had presented with mouth breathing, snoring and sleep apnoea together.

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Table 5: Distribution of study subjects based on age and symptoms

Symptoms	N	Age in years			Chi Square Value	P Value
		4-6yrs	7-9yrs	10-12yrs		
Mouth Breathing	58	18	20	20	1.29	0.524
Snoring	82	20	30	6	1.6	0.449
Mouth Breathing + Snoring	36	7	15	14	1.92	0.384
Mouth Breathing + Snoring + Sleep apnea	4	4	0	0	11.26	0.004

Childrens presented with all the three complaints, belong to the age group between 4- 6 years.

Table 6: Distribution of study subjects based on gender and symptoms

Symptoms	N	Gender		Chi Square Value	P Value
		Male	Female		
Mouth Breathing	58	36	22	0.246	0.62
Snoring	82	50	32	0.181	0.671
Mouth Breathing + Snoring	36	24	12	1.04	0.307
Mouth Breathing + Snoring + Sleep apnea	4	2	2	0.174	0.677

Discussion

Chang Feng Hwanga *et al*., in 2004 did a prospective analysis of adenoid choana ratio of 42 patients undergoing adenoidectomy & was compared with 28 control groups. By using zero degree endoscope pictures were taken & adenoid choana ratio [A/C] was calculated. It resulted as A/C ratio in adenoidal hypertrophy was 0.86 & was significantly higher than control group 0.44. They concluded that A/C ratio provided the 2 dimensional information of nasopharyngeal airway. The adenoid with a A/C ratio more than two third is considered pathological enlargement [5].

Johannesson S. did a study in 1969, by taking lateral radiographs of nasopharynx. He assessed the adenoid thickness by measuring the distance along a perpendicular line drawn from the pharyngeal tubercle on the base of skull to maximal adenoidal convexity. He found that lateral radiograph is the best diagnostic tool for adenoid assessment [6].

Edmir *et al*., did a study in 2004 on 20 mouth breathing children. Lateral x-ray of nasopharynx taken and assessed based on Cohen and Konak method in which soft palate thickness and the air column width between the palate and highest point of convexity of adenoid. Nasofibroscopic procedures were initially videotaped and best choanal images were selected. Adenoid size was assessed with accuracy. It was

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considered small adenoid when it occupied less than half of choana, medium adenoid when 50-70% of choana and large adenoid when over 75% of choana is filled. Study done by x-ray showed 7-small, 6-medium, 7-large adenoid. According to endoscopy 5-medium and 15- large adenoids. Average x-ray sized adenoids was 2cm and of nasofibroscopy was 2.75cm [7].

Keith *et al*., did a retrospective study on 61 children in 2010. Radiograph of nasopharynx and flexible nasopharyngoscopy was done. He found that both ANR and endoscopic nasopharyngoscopy correlated well [8].

Sema *et al*., did a study on 95 children in 2010 with upper airway obstruction. Clinical symptoms were assessed. All underwent ENT examination and the tonsil size was graded, digital lateral soft tissue radiographs of nasopharynx were taken. Study did not find statistically significant correlation between symptom scores and radiologic measurement. Correlations between obstructive sleep apnea score and ANR were weak not significant. But found a statistically correlation between tonsil grade and symptom score. He concluded that radiologic measurement of nasopharynx obstruction do not correlate with clinical symptoms [9].

Orji *et al*., did a study on 64 children aged 1-12years in 2008. He evaluated the adenoidal obstruction in children. Symptom assessed included snoring, mouth breathing and obstructive breathing during sleep. Each symptom was rated on four point scale as absent=0, mild=1, moderate=2, severe=3. ANR was assessed from radiographs and scaled as minimal, moderate and marked obstruction. Both symptomatology scores and roentgenographic rating showed significant correlation with age [10].

Jack L Paradise *et al*., conducted a study from 1971 to 1991 on 1033 children. Mouth breathing and hyponasality were each rated on four point scale as none=1, mild=2, moderate=3, severe=4. Nasal obstruction index was evaluated. X- ray of nasopharynx was evaluated as adenoid size small, normal, moderately large, very large and nasopharyngeal airway patency as simple, borderline or narrowed respectively anterior or inferior to adenoid. He found that clinical signs were well correlated with roentgenographic findings [11].

Capitanio *et al*., stated that adenoidal shadow is usually visible in infants aged 6months and older [12].

Conclusion

Majority of childrens had presented with only snoring. 36 of them had presented with mouth breathing and snoring. Only 4 childrens had presented with mouth breathing, snoring and sleep apnoea together.

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